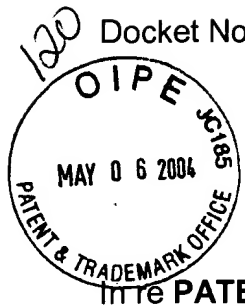


IFW AF/1733
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120 Docket No. FIRE.P9905052

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re **PATENT** application of:

Applicants: David G. Abdallah, Jr.
Application No.: 09/812,293
For: RADIAL TIRE HAVING A WRAPPED BODY PLY WITH TWO ROWS OF REINFORCEMENT CORDS
Filing Date: March 20, 2001
Examiner: Adrienne C. Johnstone
Art Unit: 1733

APPEAL BRIEF

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This brief is being submitted in connection with the appeal of the above-identified application.

I. REAL PARTY IN INTEREST

The real party in interest in the present appeal is Bridgestone/Firestone, Inc., the assignee of the present application.

II. RELATED APPEALS AND INTERFERENCES

Appellants, appellants' legal representatives, and/or the assignee of the present application are unaware of any appeals or interferences which will directly affect, which

Issue C

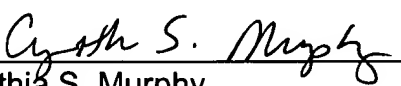
Claims 7-10 stand finally rejected as being obvious over Japanese Patent Application 5-294104. These claims set forth that the sheet has a width of about 150 mm to about 250 mm, that each row comprises between about 50 to about 600 cords, that the cords each have a diameter of about 0.3 mm to about 2.0 mm, and that the reinforcement cords in each row are spaced from adjacent reinforcement cords in the same row a distance of about 0.1 mm to about 3.8 mm. These claims depend from claim 21, which sets forth that the plurality of rows of reinforcement cords are embedded in the sheet by extruding an elastomeric material between and around the cords in the plurality of rows. As was discussed above, the Japanese reference does not show or suggest such an embedding.

X. CONCLUSION

In view of the foregoing, appellant respectfully submits that claims 2-10 and 21-23 are patentable over the applied art and that the final rejection should be reversed. This brief is being submitted in triplicate along with a check in the amount of \$330.00 to cover the fee for filing this brief in support of the appeal.¹⁵

Respectfully submitted,

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The PTO did not receive the following
listed item(s) a check for \$330.
but we did receive \$300.

15. Should a petition for an Extension of Time be necessary for the timely filing of this brief (or if such a petition has been made and an additional extension is necessary), petition is hereby made and the Commissioner is authorized to charge any fees (including additional claim fees) to Deposit Account No. 18-0988, Order No. FIRE.P9905052.

will be directly affected by, or which will have a bearing on the Board's decision in the pending appeal.

III. AFTER FINAL ACTIONS

A response was filed to the final Office Action and, in this response, it was proposed that claims 24-26 and 28 be canceled. In a subsequent Advisory Action, the proposed amendments were entered.

IV. STATUS OF CLAIMS

Claims 2-18 and 21-23 are pending in the application, claims 11-18 have been withdrawn from consideration, claims 2-10 and 21-23 stand finally rejected and are the subject of this appeal. A clean listing of the claims on appeal is attached as Appendix A.

V. BACKGROUND OF INVENTION

A pneumatic radial tire will typically include one or more body plies forming its inner carcass. Each of the body plies extends between beads and has lateral end portions turned respectively therearound. An inner liner extends between the beads and has lateral end portions connected to the inner edges of sidewalls by suitable strips and/or splices. The outer edges of the sidewalls blend with respective ends of the tread and the tread can be reinforced with tread plies and/or belts.

During the building of a radial tire, one or more body plies are wrapped around a tire building drum over an inner liner (which was previously wrapped around the drum). The non-circumferential edges of the now cylindrically-shaped body ply are overlapped to form an axially extending seam. The remaining inner and outer carcass components (e.g., beads, splices, strips, belts, tread slabs, etc.) are then also assembled on the building drum in a suitable sequence to form a green tire. The green tire is then shaped and cured to form the completed tire.

Typically, body ply material is manufactured by calendering a single row of reinforcement cords in a rubber material. When a radial tire construction requires a

double layer of reinforcement cords in the tire's inner carcass, two separate body plies are commonly used to meet this requirement.

VI. SUMMARY OF INVENTION DEFINED IN THE CLAIMS ON APPEAL

The invention defined in the claims on appeal provides a green tire having a body ply 12 which can incorporate a plurality of rows of reinforcement cords and which can be made by a relatively inexpensive retrofit of existing extrusion equipment.¹ When making the green tire, the body ply 12 is wrapped around a tire building drum 24 over the inner liner 16, which was previously wrapped around the drum 24. The non-circumferential edges of the now cylindrically shaped body ply 12 are overlapped or butt-spliced together to form an axially extending seam. The associated carcass components (e.g., beads, splices, strips, belts, tread plies, slabs, etc.) are then also assembled on the building drum 24 in a suitable sequence to form the green tire.² (See Figure 2, below.)

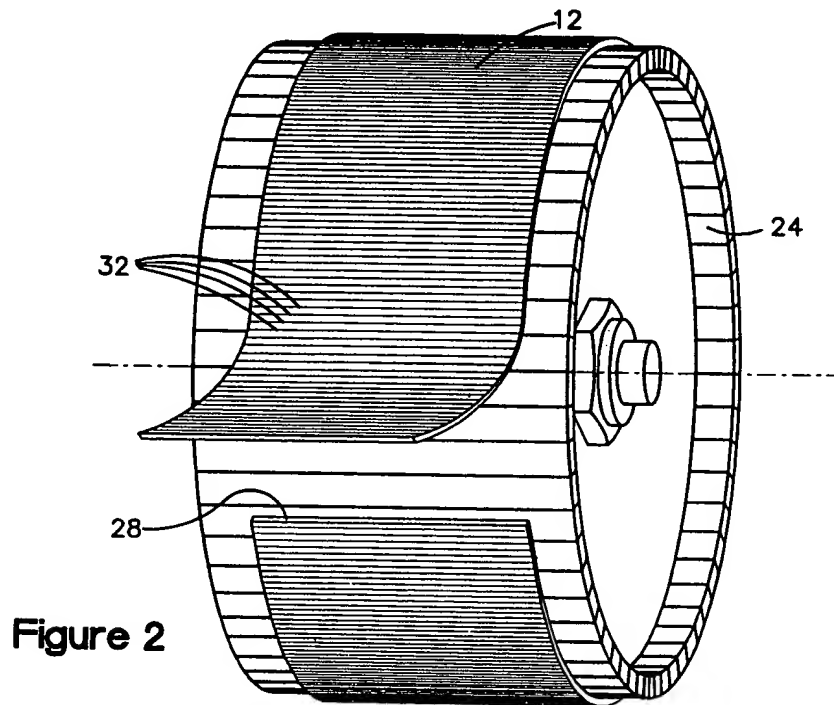


Figure 2

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1. Specification, page 2, lines 3-6.
 2. *Id.*, page 3, line 26 through page 4, line 2.

The body ply material 12 comprises an elastomer sheet 30³ and a plurality of reinforcement cords 32⁴ embedded therein. In the completed tire 10, the reinforcement cords 32 extend in a direction parallel to the tire's axis. During building of the green tire, the reinforcement cords 32 extend in a direction parallel to the axis of the drum 24 and perpendicular to the axial seam.⁵ The reinforcement cords 32 are arranged in a plurality of rows thereby making stacking of multiple body plies unnecessary during tire manufacture.⁶ Accordingly, when a tire construction requires a double layer of reinforcement cords, a single body ply 12 will meet this requirement.⁷ (See Figure 3, below.)

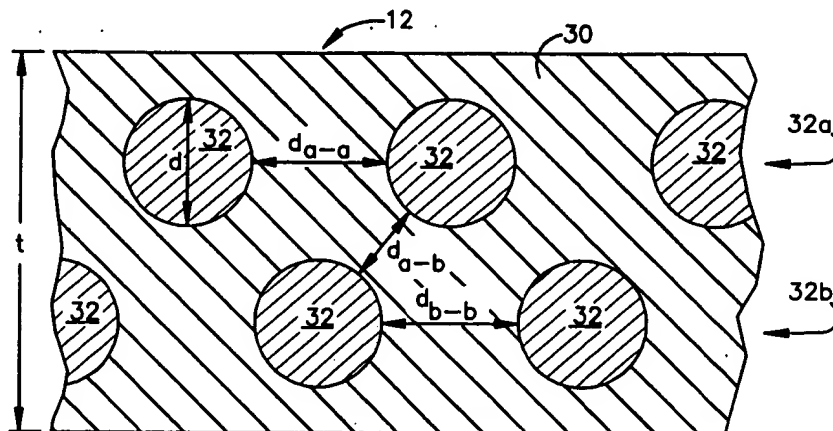


Figure 3

The reinforcement cords 32 can be arranged in two parallel rows 32a and 32b and the reinforcement cords in the row 32a can be transversely staggered relative to the cords in the row 32b.⁸ Typically, each row 32a/32b will comprise between about 50-

3. The elastomer sheet 30 can comprise a roughly rectangular sheet of rubber with a thickness t of about 0.5 mm to about 2.0 mm and a width w of about 150 mm to about 250 mm. (Specification, page 4, lines 17-19.)

4. The reinforcement cords 32 can be formed from polyester, steel, fiberglass or any other suitable metal or organic textile. (Specification, page 4, lines 19-20.)

5. *Id.*, lines 4-9.

6. *Id.*, lines 10-12.

7. *Id.*, lines 14-15.

8. *Id.*, lines 29-31. An "unstaggered" arrangement between the reinforcement cords in adjacent rows is also possible with, and contemplated by, the present

600 cords 32, with each of the cords 32 having a diameter d of about 0.30 mm to about 2.0 mm. The adjacent cords in the row 32a are spaced a distance d_{a-a} of about 0.1 mm to about 3.8 mm from each other and adjacent cords in the row 32b are spaced a distance d_{b-b} of about 0.1 mm to about 3.8 mm from each other, and these distances can be equal and uniform in the two rows 32a and 32b.⁹

VII. ISSUES

A. Claims 2-10 and 21-23 are rejected under 35 USC 102(b) as being anticipated by Japanese Patent Application 5-294104.

B. Claims 2-10 and 21-23 are rejected under 35 USC 103(a) as being unpatentable over Japanese Patent Application 5-294104 in view of U.S. Patent No. 4,274,821 to Kiemer, U.S. Patent No. 4,300,878 to Ible, U.S. Patent No. 4,657,718 to Sicka, and U.S. Patent No. 5,292,472 to Tompkins.

C. Claims 7-10 are rejected under 35 USC 103(a) as being unpatentable over Japanese Patent Application 5-294104.

VIII. GROUPING OF CLAIMS

For the purposes of this appeal only, the claims stand or fall as follows:¹⁰

A. Claims 2-10, 22 and 23 stand or fall with claim 21.

B. Claims 2-10, 22, and 23, stand or fall with claim 21.

C. Claims 7-10 stand or fall with claim 21.

IX. ARGUMENT

For the following reasons, claims 2-10 and 21-13 are believed to be patentable over the applied art.

invention.

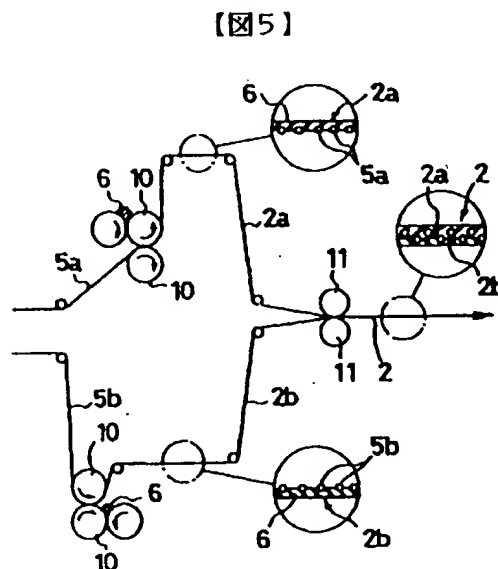
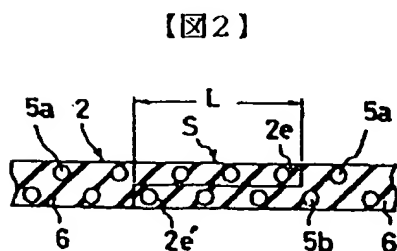
9. *Id.*, lines 21-23.

10. This grouping is conditioned upon the Examiner not entering any new grounds of rejection and/or any new points of argument.

Issue A

Claims 2-10 and 21-23 stand finally rejected as being anticipated by Japanese Patent Application 5-294104. These claims set forth a green tire incorporating a body ply comprising an elastomeric sheet and a plurality of rows of reinforcement cords embedded therein by extruding an elastomeric material between and around the cords in the plurality of rows,

The Japanese reference discloses a carcass layer 2 comprising a first row of cords 5a and a second row of cords 5b. (See Figure 2, below.) According to the Examiner's translation, this "layer" is actually two "half layers" 2a and 2b joined together. Specifically, a calendering roll 10 covers the upper side of the cords 5a with rubber 6 to form the half layer 2a, and another calendering roll 10 covers the lower side of the cords 5b with rubber 6 to form the half layer 2b. The half layers 2a and 2b are then "laminated" together with a calendering roll 11. (See Figure 5, below.)



Accordingly, the Japanese reference does not show or suggest a body ply comprising an elastomeric sheet and a plurality of rows of reinforcement cords embedded in the elastomeric sheet. Instead, this reference specifically teaches two

elastomeric sheets, each having one row of reinforcement cords.¹¹ In contrast, the claims at issue specify that embedding of the cords is accomplished by extruding an elastomeric material between and around the cords in the plurality of rows.¹²

The Examiner contends that in the Japanese method, “the rubber material still hot from the calender would flow around the cords of both layers, thus providing a reasonable basis for inferring that the body ply of this embodiment would be structurally indistinguishable from the claimed extruded body.”¹³ It is respectfully submitted that, although there might be some “flow,” the final profile would be significantly different than that found in the claimed extruded body. In fact, the Japanese reference itself appears to assert that its resultant product is structurally different from body plies that are not made with two separate sheets or layers. The Board is also asked to please note that the claims are directed to a “green tire” whereby the effects of the heat of vulcanization need not be taken into consideration.

Issue B

Claims 2-10 and 21-23 stand finally rejected as being obvious over Japanese Patent Application 5-294104 in view of Kiemer (4,274,821), Ible (4,300,878), Sicka et al. (4,657,718), and Tompkins (5,292,472).

Kiemer and Ible are cited as showing that “extrusion is a notoriously well know technique for manufacturing cord reinforced plies for tires” and that it therefore would have been obvious “to use such well known alternative technique to manufacture the body ply.” However, the extrusion dies disclosed by these references can only

11. As was explained in the background portion of applicant’s specification, “[t]ypically, body ply material is manufactured by calendering a single row of reinforcement cords in a rubber material,” and “[w]hen a radial tire construction requires a double layer of reinforcement cords in the tire’s inner carcass, two separate body plies are commonly used to meet this requirement.” The Japanese reference appears to reflect this “typical” approach as to the incorporation of a plurality of rows of reinforcement cords into a single body ply.

12. It is respectfully submitted that calender embedding and extrusion embedding result in different respective structural outcomes in the body ply, which would be ascertainable by inspection of the tire.

13. Paper No. 11, page 3.

accommodate one row of reinforcement cords. (See Kiemer Figure 7, and Ible Figure 2, below.)

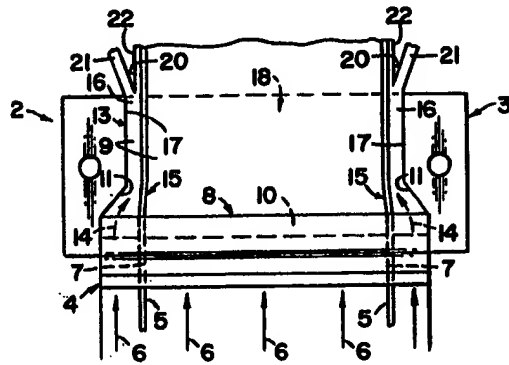


FIG. 2
(PRIOR ART)

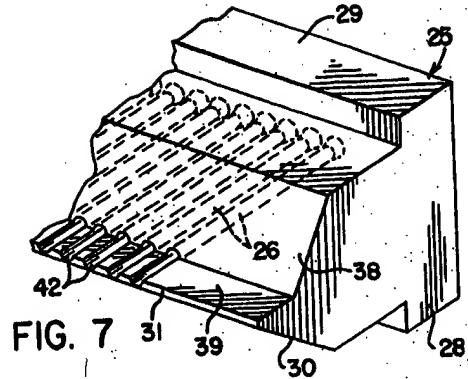


FIG. 7

The Examiner contends that he cites Sicka and Tompkins to show that "one of ordinary skill in the art would be well aware of various conventional techniques of extruding rubber around multiple layers of tire reinforcing cords to form a tire reinforcing ply having multiple layers of reinforcing cords therein." However, these references each disclose a coextrusion apparatus for making a tubular elastomer ply from first and second concentric streams of elastomeric material.¹⁴ (See Sicka Figure 4 and Tompkins Figure 1, below.) Thus, Sicka and Tompkins provide absolutely no insight into modifying the Kiemer die and/or the Ible die to accommodate more than one row of reinforcement cords.

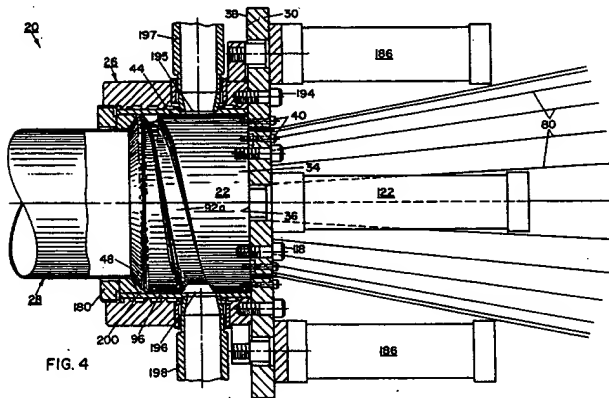


FIG. 4

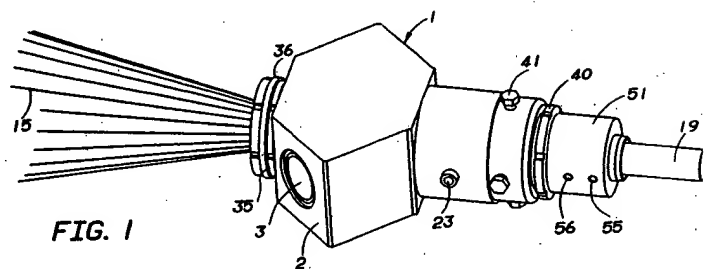
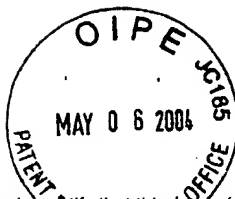


FIG. 1

14. As explained in the background of applicant's specification, an extrusion apparatus for manufacturing a circular tube of body ply material having two rows of reinforcement elements can provide many advantages, including a seamless construction. However, the extrusion apparatus needed to produce such a body ply requires a significant initial equipment investment. (Specification, page 1, line 26 through page 2, line 2.) It is further noted that a body ply produced by such an apparatus does not have "edges forming an axially extending seam."



CERTIFICATE OF MAILING

I hereby certify that this paper (along with any paper or item referred to as being attached or enclosed) is being deposited with the United States Postal Service on the date shown below with sufficient postage as first-class mail in an envelope addressed to Mail Stop Appeal Brief - Patents, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Date: May 4, 2004

Claudia A. Bader
Claudia A. Bader

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APPENDIX A

2. A green tire as set forth in claim 21, wherein the reinforcement cords in one row are transversely staggered relative to the reinforcement cords in an adjacent row.
3. A green tire as set forth in claim 2, wherein the plurality of rows are two parallel rows of reinforcement cords.
4. A green tire as set forth in claim 21, wherein the plurality of rows are two parallel rows of reinforcement cords.
5. A green tire as set forth in claim 21, wherein the elastomeric sheet is made of rubber.
6. A green tire as set forth in claim 21, wherein the sheet has a thickness of about 0.5 mm to about 2.0 mm.
7. A green tire as set forth in claim 6, wherein the sheet has a width of about 150 mm to about 250 mm.
8. A green tire as set forth in claim 21, wherein each row comprises between about 50 to about 600 cords.
9. A green tire as set forth in claim 8, wherein the cords each have a diameter of about 0.3 mm to about 2.0 mm.
10. A green tire as set forth in claim 9, wherein the reinforcement cords in each row are spaced from adjacent reinforcement cords in the same row a distance of about 0.1 mm to about 3.8 mm.

21. A green tire incorporating a body ply comprising an elastomeric sheet and a plurality of rows of reinforcement cords embedded therein by extruding an elastomeric material between and around the cords in the plurality of rows, the body ply having edges forming an axially extending seam, wherein each of the reinforcement cords has a diameter d , wherein adjacent cords in a first of the plurality of rows are spaced a distance d_{a-a} and wherein adjacent cords in a second of the plurality of rows are spaced a distance d_{b-b} and wherein these distances are equal and uniform.

22. A green tire as set forth in claim 21, wherein the body ply has sliced edges forming the axially extending seam.

23. A green tire as set forth in claim 21, wherein the reinforcement cords extend substantially parallel to the axis of the green tire.